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ABSTRACT

This unit, developed by the Third World Science Project, is designed to add a multicultural element to existing science syllabi (for students aged 11-16) in the United Kingdom. The project seeks to develop an appreciation of the: boundless fascination of the natural world; knowledge, skills, and expertise possessed by men/women everywhere; application of knowledge and skills to solve the practical problems of everyday life; impact of modern technology in the world; and the influence of the cultural background on the perception of knowledge, problems, and solutions. The major focus of the unit is on obtaining water from water supplies located in rural areas, and on carrying it in a pot or on the head to houses/fields long distances from the source. Activities designed to demonstrate collecting water from deep wells and on carrying water by hand or on the head are included. Also included is a story ("My Husband, My Master") about a mother in Tanzania (East Africa). The story, presented to illustrate what it is like being a women living in poor conditions, includes comments on fetching water, a task reserved for women in the village of Msinune. (JN)

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CARRYING LOADS ON HEADS

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THIRD WORLD SCIENCE

Third World Science seeks to develop an appreciation of:

1 The boundless fascination of the natural world

2 The knowledge, skills and expertise possessed by men and women everywhere

3 The application of knowledge, skills and expertise to solve the practical problems of everyday life

4 The impact of modern technology in the third world

5 The influence of the cultural background on the perception of knowledge, problems and solutions

The following Units have been designed to fit into existing science syllabuses in the United Kingdom:

CARRYING LOADS ON HEADS: CHARCOAL: CLAY POTS:
DENTAL CARE: DISTILLATION: ENERGY CONVERTORS:
FERMENTATION: HOUSING: IRON SMELTING: METHANE DIGESTORS:
NATURAL DYES: PLANTS AND MEDICINES: SALT: SOAP.

The method of use is not closely prescribed. As resources teachers may use them in different ways though suggestions are offered. Feedback is invited from teachers concerning (a) the use made of the material (b) pupils reactions, if possible in their own words, and (c) suggestions for improvements, additions etc.

Please send feedback, ideas and requests to:

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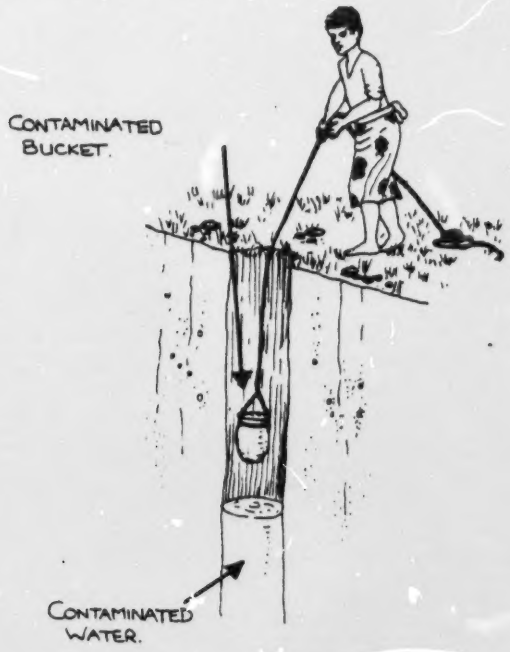
CARRYING LOADS

A typical water supply in a rural area may be a pond, river, lake or water hole situated up to several kilometres from the village it serves. Transport of the water in cans or other vessels, usually by women, represents a major daily work load. Other villages are served by a well or other supply in the village itself and here too there is a transport problem. (In some cases the water supply is at the foot of a hill on which the village is situated, necessitating a long and laborious climb with a heavy load.) In Upper Volta, West Africa, some women walk for two or three hours each day to the river or water holes 12 kilometres away. They return carrying 25 kilos of water in round pots on their heads. This trip uses up 600 calories a day, which is a third of what their daily food provides.

The well is usually a simple, lined hole in the ground - sunk to a depth of the water table. Water is taken out by lowering a leather bucket, and pulling it back up. Some of the water is spilt before it reaches the top of the well. The water is then carried in a pot by hand or on the head, to the house, or to the field or growing area.

A SIMPLE WELL.



This sounds simple and straightforward and in no way provides an indication of the work involved.

THINGS TO DO

1) If the school is several storeys high, lower a plastic bucket from an upper classroom window. Students below can fill it with water, and it can then be raised to the window. How much spills on the way?

2) Get the class to carry water in plastic buckets for a hundred yards or more - by hand, and on their heads. (plastic rubbish bags - with holes cut for the head and arms will save them from drenching their clothes.)

The water could be emptied into a bath or large tank. How long does it take to fill the bath by this means? For comparison, the class could fill a bath directly from a tap and time the operation.

What do they think of the exercise? Was it hard work or easy? If all the water used in their homes had to be collected from a well, what difference do they think it would make to the way they thought about and used water?

Can the class suggest and design new or improved methods of getting water out of the well, and also transporting it to the house or to the fields?

Experiment

1) Fill a bucket with heavy books or water. Lift the bucket and hold it away from your body so that you could walk if you wanted to. Time how long you can hold the bucket for and make a note of the muscles which ache.

2) After you have had a rest, lift the loaded bucket onto your head. Use a rolled up handkerchief or a piece of sponge to pad your head. Now time how long you can hold the bucket on your head, support it with your hands if you wish. Make a note of the muscles which ache this time.

FIG 1.

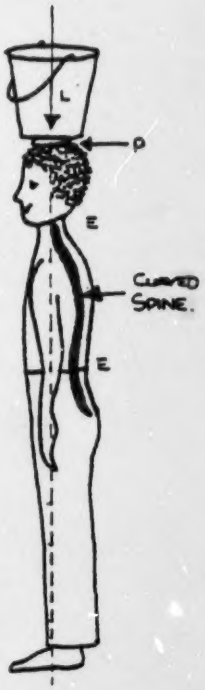


FIG 2.

You should find that you can hold the bucket on your head for much longer than you can hold it in your hand. This is because when the load is on your head you are asking your muscles to use less energy than when the load is held in your hand. When you are carrying the bucket in your hand you have to move it away from your body to stop it hitting your legs. By doing this you are moving the load (L) further away from the vertical line through the pivot (P) which is in your shoulder (see fig. 1). Because the load is so far away from the body, the muscles in the arm and back have to use a lot of energy to hold the bucket. When the load is on the head it is directly above the pivot, so a lot less effort is needed. However, the load is pressing down on the spine which is naturally curved, and this will put a strain on it, (see fig. 2). Some energy has to be used by the neck and back muscles to keep the spine rigid.

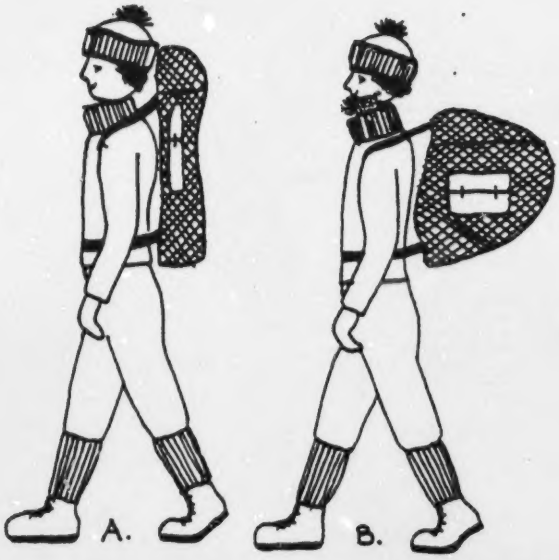
You probably would have noticed that it is quite difficult to balance the bucket on your head for a long time. It takes a lot of practice before you can balance a heavy load on your head without using your hands to support it. Many people living in the towns and villages of Africa, Asia and the West Indies are able to carry loads on their heads because they learn the skill from a very early age. Illustration 1. shows young girls from Malawi, East Africa, carrying maize cobs in baskets on their heads.

Not everyone in the world is fortunate enough to have water piped into their homes. We are lucky, when we want to drink we only need to turn a tap on. It seems very simple, but the taps are connected to miles of underground pipes to pumping stations, water filters and reservoirs. In many areas of the world supply is a big problem, often because not enough rain falls during parts of the year or because the climate is so hot and dry that the lakes and rivers dry up. In such places women sometimes have to walk miles from their homes in order to find water. Usually the young girls have to help their mothers collect the water and they soon learn that it requires much less effort to carry water on the head than by hand. To get an idea of what it is like being a woman living in such poor conditions read the story 'My husband, my master' which is about a mother in Tanzania, East Africa.

Illustration 1. Girls from Malawi, East Africa carrying maize cobs in baskets.

Things to Think About

In olden days in Europe yokes were used for carrying loads. Yokes enable two buckets to be carried at a time. Find out what you can about the use of yokes in Europe.



Which rucksack is better designed for hikers who want to go on long walks?

Why?

What would be the most practical and effortless way of carrying your school books around?

What is the method you use for carrying your own school books? Do you use this method because it is fashionable or because it is practical?

My Husband, My Master.

Hadija Muyombo, a thirty-nine year-old grandmother in a Tanzanian village, tells Frĕdrik Schiniander her own story of life in a poor village and the traditional burden of work which she and other women of the village have to bear.

My name is Hadija Muyombo. According to our traditions, the surname comes from my father. Both boys and girls go through life with their father's names, never their mother's.

We live in a distant village of Msinune, about one hundred miles north of Dar-es-Salaam in Tanzania. The area is flat and dry, and we make a living

by cultivating cassava and beans.

I am thirty-nine year old, which is quite old for our people. I think of my own life as having been long and strenuous. Thirteen babies have more or less worn me out. Six of my children died as infants, while seven are still alive. It is the same in most of the families around here; about half of the children never grow up.

Two of the eldest children are now married, and I have already four grandchildren. I love them dearly. To us, children are the most important thing in life. When we marry, it is not above all to get a spouce but to get children.

My husband's first name is Saidi. Our families used to live close to each other, and it is natural for us to consider marriage when we reached that age, which in our society is fifteen for girls and one or two years more for boys.

I am Saidi's only wife. In our country a man is allowed up to four wives, and having only one is fairly exceptional. Take for instance my eldest son, he has already taken three wives.

According to the law, the first wife must give consent if the husband wants to marry a second wife. Personally, I would have been more than willing to agree if Saidi wanted to have another wife, as this would mean that the two of us could share all the daily work.

But Saidi never wanted another wife. Of course, money would have been involved, and as long as I have given him adequate number of children, he has not seen any need for another wife. I have often desired to be relieved of some of my work, but as long as Saidi had made up his mind there is nothing I can do to change it.

I had my thirteenth birth only a few months ago, and most of my mature life I have had to care for a baby in addition to all other work in the house and in the fields. For a long time I have wanted no more children, but I keep on having them as long as I am together with my husband.

My working day starts ar six in the morning. We have no watch, but at this time the sun rises and tells us that the day has begun. The first few hours, before it gets unbearably hot, I spend in the fields. Later I wash clothes, cook and attend to the children.

At least twice a day I go to fetch water. We are fortunate in our village,

as we only have to walk about half an hour to a large well, which never dries out even in the dry season. In our neighbouring village they have no well, so their women have to come to us to fetch water. This means they have to walk almost two hours each way.

Water is always fetched by the women. It is unthinkable to imagine a man carrying water bucket on his head. A girl is only a few years old when she is sent for the first time with a bucket or a pot to collect water.

Therefore, it is very important to have a fair distribution of boys and girls among your own children.

Boys have no obligations in the home. They just run about and play, while the girls often work just as hard as their parents.

The husband's job is to work in the fields and to cut firewood. In the field work, he is assisted by the women of the family, who also have to take care of the rest of the daily work. Beside fetching water and attending to the housework, they look after the animals and the smaller children.

Reference

New Internationalist No. 25, March, 1975, p.6 & 7. "My Husband, My Master'.

Oxfam News and Topic Sheet, 'What is Appropriate Technology'.

C.W.D.E. - International Development Association (IDA) - illustration of Girls from Malawi Carrying Maize Cobs.

International Labour Office - illustration of Water Carriers in the Upcountry Village of Le Bontike.

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In this phase of the project 100 sets of 14 Units have been produced and distributed to schools, teachers' centres and teacher training establishments. Draft material has been prepared for further Units.

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